DOCUMENT RESUME

ED 075 913 EA 005 038

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TITLE An Interactive Network for the Introduction of Innovations in Education: Organization, Training, Operation, and Impact.
PUB DATE 27 Feb 73
NOTE 35p.; Paper presented at American Educational Research Association Annual Meeting (58th, New Orleans, Louisiana, February 25-March 1, 1973)

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Behavioral Objectives; *Change Agents; College Faculty; Consultants; *Curriculum Development; Educational Innovation; *Elementary School Science; Information Dissemination; *Inservice Programs; *Instructional Materials; Networks; Organizational Change; Speeches
IDENTIFIERS Process Education

ABSTRACT

The concept, organization, and operation of an interactive network for curriculum change is described, and data concerning the impact of this collaborative activity on instructional practice in public schools and colleges is presented. Specifically, the paper focuses on (1) the characteristics of a prototype model for harnessing the innovative energies of individuals and institutions (public schools, State departments of education, colleges, federal agencies); (2) how participants were prepared to serve in the networks; (3) activities in which participants engaged; and (4) the network's impact on instructional practice (including pupil performance) in participating public schools and colleges. (Author)

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An Interactive Network for the Introduction of Innovations in Education: Organization, Training, Operation, and Impact

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EA 005 038

AERA Annual Meeting

New Orleans, Louisiana

February 27, 1973

A B S T R A C T

The concept, organization, training, and operation of an interactive network for curriculum change are described and data concerning the impact of this collaborative activity upon instructional practice in public schools and colleges are presented. Specifically, this report focuses on the following questions: (1) what were the characteristics of a proto-type model for utilizing the innovative energies of individuals in institutions such as public schools, state departments of education, colleges, and federal agencies; (2) how were participants prepared to serve in the networks; (3) what were the activities engaged in by participants; and (4) what was the network's impact on instructional practice (including student performance) in participating public schools and colleges?

Reporting Session #14.10
Jung Hotel - MR #10
February 27, 1973
8:45 a.m. - 10:15 a.m.

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CONCEPTUAL FRAMEWORK

The late 1950's provided much evidence of the increasing rate of change and curriculum innovation in our elementary schools. It appears reasonable to presume that such areas of education as curriculum materials, teaching methods, and teacher training will continue to be the dimensions of investigation as a result of increasing demands for change and innovation from society in general as well as from professional educators.

The 1960's may some day be known as the decade which gave rise to a real commitment to process education in the general curriculum of the American elementary school. Process education is:

> ...an instructional orientation designed to elicit skills and attitudes in a reality oriented, emotionally safe environment. The skills to be achieved and the attitudes to be fostered enable the student to become an inner-directed, self-initiating, self-evaluating problem solver.
>
> (Herse, Wallace, & Bickel, 1970, p. 1)

Many elementary school process-promoting curricular studies have been organized as a result of great expenditures of time, talent, and money. These studies have been conducted for the specific purpose of strengthening process-oriented instruction at the K-6 level. A process-promoting curriculum is:

> ...an instructional program focusing on skills which an individual must utilize to fulfill his need to understand, organize, and interpret his experience. These skills may be conveniently categorized into clusters termed cognitive, psychomotor, motivational, affective, social-interactive, and interpersonal. Dealing with one's experience requires the effective use of these skills for learning, problem-solving, and creative expressive living.
>
> (Cole, 1972, p. 78)

Many school districts in the future will be utilizing the services of an external consultant for the purpose of providing inservice education

to teachers who will be implementing some type of process-promoting curriculum in their elementary schools. The inservice program may be designed to change teacher behavior through the utilization of a curriculum vehicle to elicit the key elements which are commensurate with the goals of process education. This particular approach to teacher change is an inservice program focusing on the learning environment of the pupil.

If it can be assumed that the teacher is lacking in something, whether this be knowledge of subject matter, familiarity with new teaching strategies, familiarity with materials, or experience in putting these elements together skillfully in interaction with students, and if it can be assumed further that an external consultant has these knowledges, skills or abilities, then the idea is to make these factors known to the teacher who does not have them in the midst of classroom interactions. The provision for teacher training in the elementary school by an external consultant may greatly enhance the success of an implemention of a process-promoting curriculum, thus assuring a reality oriented, emotionally safe environment for pupils to develop skills and attitudes necessary to become self-initiating, self-directing and self-evaluating problem solvers.

A Rationale

It cannot be assumed that widespread dissemination of an improved component or curriculum in process education is any guarantee of widespread effective utilization. Acceptance and appropriate use by teachers and principals is still to be won within the elementary school. If teaching competencies are to be developed to make the innovative program a more valuable learning experience for pupils, then it would appear that the elementary school can itself be brought into a dynamic role with regard to

the implementation effort. Lippitt, one of the earlier spokesmen for change relative to teaching patterns, addressed himself to the vital nature of this concern:

> If the curriculum reform movements are to contribute to the improvement of teaching, then strategies must be created to diffuse the innovations to the elementary teachers who will ultimately use them. Action plans are needed to bring the innovations to the attention of the practitioners so that those innovations which should be preserved and those which should not can at least be sorted out.
>
> (Lippitt, 1965, p. 17)

The achievement of effective curriculum implementation is an elusive goal; it usually requires cooperative efforts by many groups of educators to aid elementary school teachers in order to gain newly needed skills and to forego comfortable and traditional teaching patterns. In the case of most process-promoting curricula, there are new materials to assemble and manipulate, observable student behaviors to be elicited, and modified interaction patterns for teacher and pupils to be established.

Most educators agree that no single person, agency, or school district can manipulate effectively all of the components of a major change in an instructional program. Pellegrin cited that:

> A great deal of effort will have to be given to the development of linkages or connections between and among specialists who play different roles. The establishment of innovations require that specialists work together in an organized and systematic fashion, with knowledge of and respect for the contributions each can make to the total process of innovation.
>
> (Pellegrin, 1966, p. 2)

The tasks of effectively installing, monitoring, and institutionalizing new process-promoting curricula in our elementary schools are arduous and cannot all be accomplished by the teacher or the principal.

Because of the technical connotations associated with the term installation, it is defined for the purposes of this report as:

> ...a subset of educational change, a dynamic intervention and interaction of people and resources organized to introduce, utilize, diffuse, and maintain instructional programs designed to promote teacher and pupil behaviors congruent with the goals of process education.
>
> (Wallace, 1970, p. 6)

Assistance is needed in procuring, assembling, and manipulating unfamiliar materials. Someone must be able to explain the philosophical and psychological bases of the curriculum and exhibit model teacher classroom behavior compatible with those foundations. If the curriculum is one of the many process-promoting or inquiry-oriented programs, it features such skills as observing, inferring, hypothesizing, valuing, and analytical thinking. These skills may have been largely passed over during the teacher's years of formal academic training. An external consultant may help teachers develop these competencies in the classroom and provide counsel and reassurance during the teacher's process skill and attitude development period. If teacher classroom behavior is to change, opportunities can be made available for the teacher to view and discuss exemplary demonstration teaching by someone skilled and knowledgeable in the process-promoting curriculum. Conferences between a consultant and teachers might follow these demonstration teaching sessions to establish or modify future performance.

Without some type of supportive assistance in the early phases of a curriculum change, the likelihood of new educational products reaching the school system with effective utilization as intended by the developers is usually minimal. At best, these innovations will be put to mediocre

use. There is a strong likelihood that such innovations will end up in the schools occasionally emphasized, abused, misused, or not used at all. Unfulfilled innovations of yesterday can be found in almost any elementary school. Guba's often quoted remark is rather appropriate:

> The country is replete with examples of innovations that failed because supporting structures were just not available. The language laboratory is our current white elephant; educational television is another example. Schools must be helped to adopt, adapt, and integrate an innovation, that is, until it has become such an accepted and valued part of the school's operation that it will be maintained under any circumstances.
>
> (Guba, 1967, p. 316)

A capable external consultant, whose forte it is to help establish an environment by means of various classroom-based activities, might help modify the climate for the components of a process-promoting curriculum to be implemented successfully. An external consultant may help to provide the linkage mechanisms by assisting teachers and principals to make the adaptions, integrations, and behavior changes which are necessary precursors of an effective institutionalization of new practices and modified learning environments.

The Vehicle

Cole (1972) defined a curriculum vehicle as an instructional system that provides learning experiences to the extent that it contains elements designed to promote process-oriented interaction among teachers, pupils, materials and the environment. This system includes materials, instructional strategies and sequences, and evaluative devices. The process-promoting elementary school science program Science-A Process Approach was chosen as the curriculum vehicle to study the process of installation and the development of a network. This curriculum was chosen because of its theoretical and operational maturation. Maturation was defined as: (1) the

program had been through extensive field testing in official tryout schools; (2) all materials for the primary grades (hardware and software) were commercially available; and (3) special teacher training materials for prospective teachers had been developed by the authors of the program.

Science-A Process Approach, like many other process-promoting curricula, is a nontextbook approach to pupil learning. Instructional materials take the form of individual teacher booklets with accompanying kits of materials for teacher and student use. The teacher usually introduces an exercise by asking questions and guiding the class, avoiding any possible lecturing. Each exercise relates to a process or group of processes associated with intellectual development. In the primary grades the pupils are exposed to the processes of observing, classifying, using numbers, measuring, using space-time relationships, predicting, communicating, and inferring. The sequencing of these processes by way of individual exercises is based on a learning hierarchy. The hierarchy reveals what prerequisite skills are needed for the pupil to be successful in a specific exercise.

A distinctive feature of Science-A Process Approach is a statement of objectives in behavioral terms, indicating anticipated terminal pupil behaviors. A key and noteworthy feature of Science-A Process Approach is its emphasis on behavioral testing. Three types of behavioral tests are provided: the "generalizing experience," the "appraisal," and the "competency measure." The "generalizing experience" provides the students with an opportunity to transfer their newly learned behaviors to a different situation. The "appraisal" is an activity where the teacher can measure the achievement of the entire class. And the "competency measure" is an activity for the

performance testing of individual students.

O R G A N I Z A T I O N

Many potential change agents can be found on the local college campus. Close contact with researchers, developers, and theorists enables the college professor to remain abreast of emerging innovations. As is well known, it is usually his professional responsibility to be constantly cognizant and searching for whatever is new and relevant, and to submit it to the usual scrutiny against characteristics of the traditional. Early knowledge of innovations, access to current research relative to those innovations, and a ceaseless flow of prospective and practicing teachers through preservice and inservice courses all contribute to the viewpoint, a position for the utilization of the college professor as an external consultant to assist more directly as a supportive mechanism by providing inservice education to the principal and teachers in an elementary school's latest attempt at curriculum innovation.

A Network

The Elementary and Secondary Education Act of 1965 had brought about the establishment of many regional networks of external consultants. Aside from the fact that many state education departments possessed their own networks of external consultants, the D & R Report (1971) mentioned that most, if not all, Title IV regional educational laboratories and research and development centers maintained networks of external consultants.

The Eastern Regional Institute for Education (ERIE), one of a national network of ESEA Title IV regional education laboratories, in its quest to study the explication and installation of process education moved

formally and systematically to bring school practitioners and college professors together on the common ground of the elementary school classroom. RAN, an interagency support mechanism known as the Regional Action Network was established by ERIE, whereby a group of college and university professors were trained to be consultants in a coordinated program that hopefully would contribute to the improvement of process education in the elementary schools of their geographical region, and instruction in the courses taught for preservice and inservice teachers.

The Strategy

Careful consideration of the needs of elementary schools and the testing of installation assumptions eventually led to the development of a change strategy which employed the talents of college and university professors. A primary goal had been to develop a strategy that could be replicated in similar regional or national situations. During the Spring of 1968, a commitment from the National Science Foundation to fund a proposal for the creation of the Regional Action Network became a reality. This announcement led to the recruitment of twenty-one college and university professors who might serve as RAN consultants.

The group selected possessed a background of training and interest in science, science education or elementary education. Most of the professors had previous experience in working with classroom teachers in inservice education programs and possessed experience in the training of prospective teachers. Careful consideration was given, not only to their experience, interest, and willingness to work with elementary teachers and pupils, but also to the willingness of their colleges and

universities to make provisions for them to render consulting service and entertain notions for instructional re-organization of the courses and programs based on their experiences in elementary classrooms at the college level.

During December of 1968 another proposal was submitted to the National Science Foundation and received funding. The intent was to continue and expand the functions of the RAN. The need was partially due to the formation of a second generation network of thirty-two highly motivated elementary schools. By September 1969, just prior to the 1969-70 school year, there was a total of fifty trained college or university professors who were members of the RAN. Not all of these professors served in an active capacity as a consultant to an assigned elementary school. Some were out of the two state region on a leave of absence or had made other commitments which made it impossible for them to participate in the network as an active consultant.

RAN Demographically

Many educators find it interesting to examine the demographic dimensions of people and places involved with innovative endeavors. The following demographic information was collected by way of a questionnaire administered at the November, 1969 follow-up meeting to the professor-consultants and staff associates of the Eastern Regional Institute for Education. When considering the locations of the installing elementary schools and colleges of the professors, 22 were from Pennsylvania and 31 functioned in the state of New York. Turning to the type of elementary school where the consultant worked, 24 professors were consulting in first

generation elementary schools (pilot) and 29 consulting in second generation schools (demonstration). When taking into account the number of teachers with which a consultant worked in a given school, 9 RAN members consulted with one to five teachers, 23 professors worked with six to ten teachers, 16 consultants interacted with eleven to fifteen teachers, and 5 network participants consulted with sixteen or more teachers.

Back at the college campus, 11 professors possessed a doctorate and 42 did not have a doctorate. When considering the academic ranks of the professor-consultants, there were 7 at the instructor rank, 11 assistant professors, 17 associate professors, 8 full professors, and 10 staff associates of the regional educational laboratory. And lastly, when taking into account the teaching specialities of the RAN members, 19 were science discipline professors, 19 were science methods professors, and 15 were elementary general methods professors.

T R A I N I N G

Shortly after the establishment of the network, provisions were made to prepare the cadre of professors to assist elementary school educators to implement new process-oriented curricula. Over a three-year period, the fifty professors had participated in a diversified training program featuring a variety of cognitive and participatory activities. A great deal of emphasis was placed also on specialized training for the role of the consultant.

Leadership Conferences

The bulk of the training occurred in two leadership conferences

(June, 1968 or June, 1969 --- basically the same model with some modifications in 1969 version). The activities of these two-week institutes focused basically on content, teaching methodologies, and consulting techniques relevant to the curriculum vehicle. Several sessions centered on the basic and integrated processes promoted by the curriculum vehicle. The characteristics of other process-oriented curricula in the same academic discipline as the chosen vehicles also were examined. Professors employed conference time to teach process-oriented lessons to small classes of elementary school children and to one or two children in microteaching episodes. To sensitize the professors to the challenges of one-to-one consulting, each professor who taught a lesson subjected his teaching performance to the constructive criticisms of his professor-colleagues and the staff of the conference. Opportunities to re-teach made it possible to test the counsel of colleagues and to bring the teaching performance in line with the maturation level, interests, and abilities of elementary school aged pupils.

Video tape and motion picture vignettes of process-promoting programs in classroom use were analyzed in conference sessions. This activity opened various discussions on such topics as appropriate learning theory, philosophical undergirdings, new evaluative schemes using behavioral objectives and various types of classroom devices for facilitating interaction analyses. The professors also engaged in the unpackaging, assembly, repair, and substitution of curricular materials. And finally, a thorough study of the lesson plans that accompany the curriculum was made to prepare them as an immediate, knowledgeable resource to the classroom teacher.

Site Visitations

A large number of the fifty professor-consultants participated as site visitors to the collaborating elementary schools engaged in the actual curriculum innovation. Teams of three or four professors made site visits to fifteen pilot schools between November, 1968 and May, 1969. A basic design was developed to allow for and schedule a common format to be used by the small groups of professors. A preparatory meeting, held the evening before the day of the visit, focused on the demographic characteristics of the school setting, the teachers, and the pupil population. During this session the quantitative and qualitative aspects of the installation were discussed, as well as the major variables in the school which seemed to be hindering and/or enhancing the innovative effort. Also, there was usually a discussion of the consultant behaviors that teachers were finding most helpful.

On the following day, the professors engaged in discussions of the installation with teachers and the principal, observed the process-oriented curriculum being taught in three to five classrooms, met with teacher-groups from various grade levels, talked to pupils, and attended a summary conference with school personnel. The professors then were asked to write a four or five page evaluative report in which they were to present personal observations about the installation in general and strategy for change. Their constructive criticisms and reflective observations were very helpful and led to some policy and procedure modifications.

Follow-up Meetings

Four two-day follow-up meetings were conducted for the consultants during 1969-70 academic year. Actually the first one was conducted in

August just prior to the beginning of the new school year. Subsequent meetings were held during November, February, and April. During the 1970-71 academic year three additional follow-up meetings were conducted in September, December and May.

These follow-up meetings served four basic purposes in the process of bringing the professors together as a mechanism for facilitating change. These sessions were quite instrumental in providing the consultants with an opportunity to communicate with each other about matters of mutual concern; the opportunity to collect data and informal feedback on the status of the overall installation effort; the setting for focusing on the solution of mutual problems; and the opportunity to further identify the characteristics of process teaching and the earmarks of effective consulting in schools.

During the latter two meetings of 1969-70 and all of the 1970-71 sessions considerable use was made of video tape recordings of teachers teaching lessons from the curriculum, and selected professors actually consulting with some of these teachers in pre-observational and post-observational conferences. Most, if not all, of the video tapes were produced by the professors in the elementary schools where they consulted. The meetings placed heavy emphasis upon small group interaction and work, and upon using the talents and expertise within the group to contribute toward the continued training of their fellow professors.

O P E R A T I O N

The training of the RAN members culuminated in the assignment of professors as consultants to fifty-five elementary schools in the states

of New York and Pennsylvania. Approximately, forty professors made twelve to thirteen consultant visits to their schools during 1968-69 and 1969-70. During the 1970-71 academic year the professors made eleven full-day visits (one per month, with the exception of September 1970, in which there were two).

In the Schools

A formal "consultant-report-form" was developed and tested by a group of the professors. The report forms revealed that the consultants engaged in many activities such as teaching demonstration lessons for teachers using an entire class or a small group of pupils; answering specific questions about the description of lessons as contained in the teachers text; answering questions about the general subject matter area; answering questions about materials, obtaining materials, replacing or repairing materials, and/or setting up materials; observing the teacher while she teaches a lesson, then describing and constructively discussing the teacher's performance in conference immediately following the lesson; assisting the teacher by modifying lessons in the curriculum to best fit the needs of the children in a particular classroom; teaching cooperatively or teaming-up with the teacher so the class was taught by both the teacher and consultant; assisting teachers in the development of new learning experiences for pupils that help to transfer skills and knowledge acquired from the new curriculum to other subject areas of the elementary school program; meeting with teachers after school or during planning periods to supply continuing inservice experiences; and speaking to PTA's and other interested community groups.

Out of the Schools

Back on the college campuses the professor-consultants were telephoning and writing to vendors who failed to deliver all-important materials, and preparing lists of books to supplement the curriculum. Some made worthwhile attempts at designing models to deal with the interpretation and reporting of student mastery of skills and competencies. They also sponsored and conducted inservice workshops for other school districts in their regions. Many consultants held follow-up conferences with installing teachers in their campus offices.

Inroads were beginning to be made by way of their influence on campus colleagues and department chairmen. Departments were beginning to order materials associated with the installing vehicle and other process-promoting programs for use in undergraduate and graduate methods courses. Student teacher placements and pre-student teacher visitations also began to cluster in many of the involved elementary schools.

I M P A C T

Before making any judgements from these data, considerable thought must be given to the use of populations instead of samples. The subjects utilized were not selected by classical random sampling techniques. Also, these data may not be representative of other populations. In addition to the limitations imposed by the use of populations, generalization from these data is further restricted, in some cases, by the small population size of the involved subjects. For these reasons, findings should be restricted to these groups of educators and classroom settings, and not applied to all populations in general.

Secondly, when considering cause-effect relationships, this report possesses limitations. Although the collected data were actually "experienced" or "lived", the assumption of causality cannot be made because of a lack of direct observation of professor-consultant functioning in many instances and the idiosyncrasies associated with the consultant's role. However, findings deemed favorable and assessed as having an impact, are described.

On Elementary Schools

This discussion is based on data collected over a two and one-half year period, beginning September, 1967, and terminating Januray, 1970. During the 1967-68 school year, the process-promoting curriculum was installed in kindergarten thru grade two in twenty-one collaborating elementary schools of diverse characteristics, geographically distributed throughout the states of New York and Pennsylvania. During subsequent school years, the process-oriented curriculum was expanded to grades four, five and six.

Time Commitment (before vs. after):

An examination was made concerning the mean time per week spent on teaching the subject before the arrival of the curriculum vehicle and after it had been installed. The collected data indicated that at the kindergarten level 66 minutes per week were spent on the teaching of the subject before and 85 minutes during the installation, showing a mean increase of 19 minutes. At the first grade level, 81 minutes were recorded before the installation and 90 minutes during it, a mean increase of 9 minutes per week. In the second grade, teachers spent 86 minutes prior to the installation and 108 minutes after, a mean increase of 22 minutes. These

data revealed mean increases occurring at all grade levels (K-2), with the greatest increase occurring at the second grade level.

Program Quantity Taught:

Viewing the process-promoting program from a quantity standpoint evokes the question, "How many exercises did teachers actually complete per grade during a given school year?" During Year 1 (1967-1968), out of 22 possible exercises, kindergarten teachers taught a mean number of 16.0 exercises, and during Year 2 (1968-1969), 18.6 exercises were taught exhibiting a mean increase of 2.6. In the first grade, where the curriculum contained 26 exercises, a mean of 14.8 exercises were taught during Year 1 and a mean of 18.8 were taught during Year 2 giving a mean increase of 4.0 exercises per year. At the second grade level, out of a possible 23 exercises, 11.3 were completed during the first year and 14.8 in the second year showing a mean increase of 3.5. These data revealed a promising trend with increases in the number of exercises taught at all grade levels from Year 1 to Year 2.

Pupil Acquisition of Behaviors:

Data were collected concerning pupil performance on tasks found in individual competency measures located at the end of each exercise booklet. These data represented a mean percent correct of those items administered to pupils for a two year period. In the kindergarten during Year 1, where 3141 pupils were tested with a mean number of 143 children tested per exercise, a mean percent of 87.1 represented correct responses; and during Year 2, where 4293 pupils were utilized with a mean number of 195 students tested per exercise, a mean 84.8% of the performance tasks administered were correct. At the first grade level during Year 1, where 2853 pupils were tested with a mean number of 110 students tested per exercise, a mean

percent correct of 87.4 was recorded; and during Year 2, where 3893 pupils were used with a mean number of 150 students tested per exercise, a mean percent of 87.2 represented anticipated responses. Second grade data during Year 1 with a total of 2115 students employed and a mean number of 92 pupils tested per exercise revealed an 86.6 mean percent correct response to the criterion-based performances; and during Year 2 where 3350 pupils were tested with a mean number of 146 pupils tested per exercise, a mean percent of 84.6 represented correct responses. Although these percentages oscillate slightly per grade from one year to the next, these data tend to indicate rather favorable results with all mean percentages above the desirable 80% level.

Classroom Behaviors:

When examining general classroom behaviors, many problems had been encountered as to what does desirable process-oriented instruction "look like." In order to deal with these problems, the professors-consultants of the network developed and tested five qualitative categories for the observation of classroom behaviors. When a consultant observed a teacher conducting a process-promoting lesson, he rated the classroom behavior on a one to six continuum. These data had been collected during the first-half of Year 3 (1969-1970).

The first of the classroom behaviors observed was "teacher reaction toward pupil response." Consultants were asked to assess the presence of this behavior on a one (teacher accepted and encouraged pupils' responses) to six (teacher rejected and inhibited pupils' responses) continuum. At the kindergarten level 68 classes were observed reflecting a mean 1.8; in the first grade 106 classrooms showed a mean of 1.9; and a mean of 2.1 was

calculated for 90 second grade classrooms. The second classroom behavior investigated was "pupil manipulation of materials provided for the lesson." Professors were asked to rate the presence of this behavior on a one (extensively manipulated materials) to six (did not manipulate materials) continuum. The collected data indicated that means of 2.1, 2.0, 2.2 were computed from classrooms of the kindergarten, first and second grades respectively for the same number of teachers at each grade level as previously indicated. The third classroom behavior examined was "lesson direction toward process-promoting objectives." RAN members were asked to judge the presence of this behavior on a one (directed at process-promoting objectives) to six (deviated from process-promoting objectives) continuum. These behaviors of teachers and pupils received a mean of 1.9 at the kindergarten level, a mean of 2.2 in the first grade, and a mean of 2.1 at the second grade. The fourth classroom behavior focused on "teacher telling or teacher questioning/guiding pupils." The network participants were asked to look at the presence of this behavior on a one (teacher questioned and guided) to six (teacher told and directed) continuum. At the kindergarten level a mean of 2.2 was obtained, first grade a mean of 2.3, and second grade a mean of 2.5. And finally, the fifth classroom behavior centered around "pupil communication using the language of the process-promoting curriculum." Consultants were asked to rate the presence of this behavior on a one (frequently used process-oriented terminology) to six (never used process-oriented terminology) continuum. A mean of 2.3 was calculated for both kindergarten and first grade pupils with second grade pupils showing a mean of 2.4. When considering all five behavior categories per grade level, the data indicated that

kindergarten (2.1) and first grade (2.1) classrooms exhibited these behaviors to a slightly greater degree than did second grade (2.3) classrooms. When viewing individual behavior categories across the three grade levels, the behavior of "teacher reaction toward pupil response" had been observed to the greatest degree (1.9); whereas "pupil communication using the language of the process-promoting curriculum received the highest mean numerical rating (2.4), which was indicative of the classroom behavior occurring least often.

Transfer of Process:

In reference to the transfer of processes exemplified in the process-promoting curriculum to other areas of the elementary school curriculum, data were collected during Year 2 of the installation. Teachers were queried by means of a written questionnaire. When asked, "How frequently do the processes stressed in the curriculum vehicle lend themselves to deliberate and effective transfer to, or application in, other curricular areas (i.e., social studies, English, math, etc.)?", the teachers responded on a one (processes are constantly taught in other areas) to seven (processes are seldom taught in other areas) continuum. The data revealed that kindergarten teachers gave the item a mean numerical rating of 2.2, and both first and second grade teachers were represented by a mean rating of 2.9. If a trend can be noted across grade levels, as indicated by way of written teacher comments concerning this item, it might be that kindergarten teachers felt that the pupil-acquired processes lend themselves to transferability to other curricular areas. Perhaps the process-oriented curriculum was viewed by teachers as having more transferability in a less rigid "readiness" program at the kindergarten level than in the more structured program beginning at first grade.

Teacher Attitude Toward Curriculum:

When considering teacher attitudes toward implementing the process-promoting program, RAN members had collected data concerning this aspect covering a period of one and one-half years. The data came from teachers' responses on a one (greatest teacher dissatisfaction) to nine (greatest teacher satisfaction) continuum. These findings represented the mean-numerical-response of all teachers per exercise per grade level. In the kindergarten during Year 2 and Year 3 means of 7.4 were recorded. At the first grade level during Year 2 a mean of 7.4 was representative of teacher attitude, and in Year 3 a mean of 7.3 reflected this dimension. Second grade data during Year 2 revealed a mean of 7.2 and in Year 3 a mean of 6.7. Grade two teacher appeared to exhibit the greatest teacher dissatisfaction with the program, whereas kindergarten and first grade teachers seemed slightly more positive. At all grade levels except kindergarten, the mean teacher attitude dropped slightly during Year 3.

Dissemination and Diffusion:

With regard to school district expansion, the collected data indicated positive affects on other elementary schools within collaborating school districts, and in some instances on elementary schools outside the districts, to the degree that they had adopted the program in their buildings. A survey of districts having a collaborative school indicated a high acceptance of the process-promoting program by non-collaborative schools. In fact, of the 184 possible expansion sites within districts having a collaborative school, seventy-four of these elementary schools (40%) adopted the process-oriented curriclum during the two and one-half years of the installation.

Fourteen of the twenty-one (67%) collaborative schools expanded the process-promoting program into one or more elementary school(s) within their district. Three collaborative schools reported being the only elementary school within the system and, therefore, could not expand. Two collaborative schools in the same district were counted only once in the data. Four systems could not expand because of fiscal difficulties.

A possible explanation of this expansion, occurring outside of the network's direct sphere of influence, was found in the Demonstration and Dissemination Days conducted by the collaborative schools. During Year 2, fourteen (67%) collaborative schools conducted Demonstration and Dissemination Days, utilizing experienced teachers and assisted by staff from local Title III centers. These Demonstration and Dissemination Days attracted a total of 786 educators from New York and Pennsylvania.

Much dissemination and diffusion also was attributed to many of the extraneous activities performed by the professor-consultants. Information was gathered by way of tape recorded open-ended interviews. The specific procedures and techniques involved in this data gathering effort will be discussed at length in the next section of this paper. Based on an information pool consisting of forty-four audio tapes out of a total possible of forty-five, the following six diffusion or dissemination activities were reported by the professors. Forty consultants (91%) revealed that they had responded informally to queries about process education from interested individuals or small groups by writing letters, answering telephone inquiries, etc. Six RAN members (14%) indicated that they had produced or assisted in the production of video tapes of process-oriented instruction which were used over closed circuit television for the purpose

of dissemination. Thirty-five professor-consultants (80%) mentioned that they had participated in PTA or PTO meetings and informational workshops for teachers and/or administrators. Seven network participants (16%) reported that they had interpreted for various educational communities the implications of process-oriented elementary school curricula for instructional programs at the secondary and college levels. Nine professors (20%) were found to have been hired, from time to time, by a non-network school district to present special programs and workshops focusing on process-promoting programs. And lastly, five consultants (11%) reported that they were hired by non-network school districts, intermediate federal agencies or private consulting corporations to offer organized courses of instruction on an inservice basis.

When considering the many possible avenues for diffusicn and dissemination by way of inter-agency cooperation or collaboration, the professor-consultant were quite an influence. Information was also gathered by way of tape recorded open-ended interviews. The following four diffusion/dissemination related activities have their foundations in thirty-nine interviews out of a possible forty-five. Twenty-six professors (67%) indicated that they had directed and/or provided instruction in an inservice setting which involved collaboration with boards of cooperative educational services, regional educational centers, county boards of educations, or state education departments. Nineteen consultants (49%) mentioned that they had written or helped to develop proposals centering on teacher-training which were submitted to governmental agencies (National Science Foundation, U.S.O.E.-E.S.E.A. and E.D.P.A., and State Education Departments) in order to initiate and/or expand the adoption of process-oriented curricula.

Eight RAN members (21%) reported that they had trained or helped to train teachers who in turn trained other teachers in their school districts (teacher-leader concept) in the use of process-oriented approaches and curricula. And finally, eight network participants (21%) discussed that they were involved with initial efforts to promote an articulation design for bringing together process-oriented education at the elementary school level with programs at the secondary and collegiate levels.

On Colleges and Universities

While serving as consultants, the professors were also engaged in activities for promoting process education above and beyond their specific elementary school consulting obligations and responsibilities. A bulk of these activities were centered on and around the various college campuses. An extensive on-site field study was conducted at the campuses of the network members during April-July, 1970. A series of criterion-based unstructured interviews were conducted by one interviewer. Although the interviewer had a plan in mind, the approach was to keep the interview open-ended. The professors were encouraged to discuss the activities in any way they felt would facilitate the outflow of information. Some of the consultants had much to say about some activities and little to say about others. Failure of an individual consultant to mention a particular activity identified by other consultants did not necessarily mean that the activity was lacking. A total of forty-five interviews were audio-taped recorded from beginning to end, criterion activities identified, and coded.

Modifying Own Teaching Behaviors:

Back at their colleges and universities many of the RAN consultants were making attempts at modifying their own teaching behaviors by applying a process approach in restructuring the content and/or methodology of their undergraduate and graduate courses. This aspect was investigated with the findings based on the following nine criterion activities. Forty-one professor-consultants responded in a taped open-ended interview. Thirty-one professors (76%) revealed that they minimized lecturing in their courses but maximized student involvement, allowing the opportunity for students to learn by way of a process approach. Twenty-six consultants (63%) indicated that they used ideas picked up from consultant training sessions by applying them in the teaching of their own courses. Seventeen RAN members (41%) mentioned that they introduced the concept(s) of behavioral objectives and/or student competencies in their undergraduate or graduate courses. Twenty-nine professors (71%) reported that they used the subject matter content courses they taught as vehicles for process education. Nine consultants (22%) represented those who used microteaching techniques in their courses for undergraduate and/or graduate students. Thirteen RAN members (32%) described that they required their undergraduate and graduate students to read literature on process-oriented education (e.g., Bruner, Karplus, C. Rogers, Krathwohl, etc.). Twenty-one professor-consultants (51%) discussed their use of teacher training materials and approaches developed during or as a result of their training sessions in the courses they taught for graduates and undergraduates. Thirty-four network participants (83%) indicated that they used ideas and materials from the installed curriculum vehicle and other closely related process-oriented program in their courses. And finally, twelve professors (29%)

reported that they required their students to teach process-promoting lessons to the pupils where they were student teaching or where they were inservice teachers. Summary findings revealed that 91.1% of the total forty-five interviewees whose data were tabulated indicated that they had performed at least one of the criterion activities. Further examination of the data reflected that the use of microteaching was the least often engaged in activity, while the utilization of materials and ideas from the curriculum vehicle and other related process-promoting programs in their courses occurred the most often. The mean number of criterion activities performed by the interviewed forty-one consultants was 4.3 with a standard deviation of 2.4.

Motivating Their Colleagues:

Also, on the college campuses the network participants were quite active with efforts at influencing their colleagues in and out of their given departments. Thirty-three RAN members reported on this dimension by way of taped interviews. Examination of this activity cluster was based on the identification of seven criterion activities. Thirty-two professors (97%) revealed that they had discussed the process approach and process-oriented curricula with other faculty members in their academic departments. Twenty-five consultants (76%) indicated that they had conversed about process education with faculty members in other academic departments of the college or university. Two RAN members (6%) mentioned that they had been observed by close associates while using the process approach in the teaching of undergraduate or graduate courses. Two professor-consultants (6%) reported that they were observed by fellow faculty members in an elementary school, while working with their student

teachers during the presentation of process-oriented lessons to pupils. Ten network participants (30%) represented those who made arrangements with other faculty members for providing inservice training and consultation directly in area elementary schools for their evening graduate students. Twenty-one professors (64%) were found to be instrumental in the promotion of interdepartmental cooperation for the development of a process approach to the preparation of preservice and inservice teachers. And lastly, eight professors (24%) discussed that they promoted to some extent the general reorganization of instructional programs within the institution toward a process orientation. Further inspection of the results revealed that 73.3% of the total forty-five interviewees whose data were tabulated mentioned that they had performed at least one of the criterion activities. Global findings indicated that being observed by fellow faculty members in both elementary schools and college courses were the least prevalent activities, whereas discussing the process approach to instruction with colleagues appeared to be the most prevalent activity. With a standard of 1.8, the mean number of criterion activities performed by the thirty-three interviewees was 2.2.

Securing Administrative Support:

Somewhat related to the field work of the RAN members and a key element to effecting institutional change in higher education were the attempts at influencing and gaining administrative support by the professor-consultants. Percentages for this for this category were based upon forty interviewees who responded out of a possible forty-five. The data described below were based on the identification of seven criterion activities. All forty professors (100%) revealed that they had received permission to engage

in field related activities, but information about their involvement was not widely disseminated among other faculty members. Forty consultants (100%) indicated that they were given consent to participate in the field based activities as long as such activities did not interfere with college-assigned duties. Thirty-six RAN members (90%) mentioned that they received approval from their administrators in "going along" with any "reasonable request" that they might have made to engage in the field related activities even though the administration did not actively encourage or initiate such involvement. Twenty-eight professor-consultants (70%) reported that they obtained an enthusiastic endorsement to participate in the field oriented functions from their department and/or division level administrators. Seventeen network participants (43%) discussed that they received acceptance by their administration for their field based involvement as a positive element when evaluating their total professional performance in reference to salary increments, promotion and tenure. Twelve professors (30%) described that they were fed back indicants from their superiors that network activities were definitely in line with institutional objectives and policies projecting a commitment for improving education in the communities served by the colleges. And finally, ten RAN members (25%) said that they received support from their administrations in the form of funds invested for conceptualizing, developing, remodeling and/or redesigning instructional strategies and facilities for the purpose of providing instruction with a process-oriented emphasis. Analyzing the results in summary fashion revealed that 88.9% of the total forty-five interviewees whose data were tabulated indicated that they engaged in at least one of the criterion activities. With regard to the

occurrence of the activities, the obtaining of support in the form of funds was done the least often, while securing permission to participate in the field based activities in two instances was the most prevalent of the criterion measures. Further examination of the data revealed that the mean number of criterion activities engaged in by the forty interviewees was 4.1 with a standard deviation of 2.0.

E P I L O G U E

If one accepts the view that classroom teaching is a form of social interaction aimed at the achievement of selected educational objectives, it then becomes important to identify and bring together those individuals who might play a dominant role in influencing behaviors of others. It is rather obvious that in classrooms the teacher influences the types of interactions which take place. The teacher exercises control over the subject matter which is presented, the learning activities in which pupils engage, and the manner in which pupils participate in these activities. The question of who influences the teacher is one which needs more empirical investigation. An external consultant in the classroom is certainly a viable possibility in this day and age.

A prototype supportive mechanism for large scale curriculum change had been created and tested. State education departments, intermediate educational agencies, and schools of education might modify the Regional Action Network (RAN) concept and employ it to accelerate and coordinate educational change in the schools of selected regions. In the process, many changes in preservice teacher education might also result. Modifications of the Regional Action Network (RAN) might facilitate more genuine interagency collaboration with highly visible results, undergirded by modest

fiscal support. This mechanism for curriculum change and diffusion should be of particular interest to leaders in schools of education who believe professors, preservice teachers, and graduate students might have more field-based, reality-oriented experience with on-going public school innovation.

It is assumed that the kind of consultant service analyzed in this report is not unlike the consultant service that may be rendered to other elementary school teachers and pupils in the upcoming decade, and even for innovations other than curriculum. If this report provokes a more intense or sophisticated analysis of the ways which external consultants possibly influence teachers within their classrooms, it will have achieved its major purpose.

It is hoped that this descriptive study will stimulate continued development and research on the processes and products of consulting in the context of a network. Hopefully, research will ultimately clarify the consultant role and function, and will enable the intervention of external curriculum consultants to have more impact.

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